

SUPPORT FOR THE AMENDMENTS

The present amendment cancel claims 1 and 5-13, amend claims 2-4, and add new claims 20-25.

Support for the amendment to claim 2, and newly added claims 20 and 21, is found in the originally filed claims and specification (See e.g., compounds 397, 399, 400, 410, 418 and 420 for the ortho position; and compounds 391, 394, 413 and 415 for the meta position).

Support for the amendment to claim 3, and newly added claims 22 and 23, is found in the originally filed claims and specification (See e.g., claim 3 for the ortho position; and compounds 36-107 for the para position).

Support for the amendment to claim 4, and newly added claims 24 and 25, is found in the originally filed claims and specification (See e.g., compounds 180-243 and 403 for the meta position; and compounds 108-179, 402, 404, 406, 407, 409 and 411 for the para position).

It is believed that these amendments have not resulted in the introduction of new matter.

REMARKS

Claims 2-4 and 14-25 are currently pending in the present application. Claims 1 and 5-13 have been cancelled, claims 2-4 have been amended, and new claims 20-25 have been added, by the present amendment.

The rejection of claims 1-19 under 35 U.S.C. § 103(a) as being obvious over Ikeda (EP 1333018) is respectfully traversed in part, and obviated by amendment in part, with respect to new claims 2-4 and 14-25.

Claims 2-4 are directed to the asymmetric monoanthracene derivatives of formulae (2)-(4), respectively. In contrast, Ikeda describes a tremendously large genus of anthracene derivatives represented by formulae (1)-(5) (See e.g., pages 3-6). Unlike the claimed monoanthracene derivatives of formulae (2)-(4), which are *asymmetrical*, each of the forty anthracene derivatives exemplified in Ikeda are *symmetrical* (See e.g., pages 9-18). Ikeda fails to provide specific examples of asymmetric anthracene derivatives according to formulae (2)-(4) of the present invention. Ikeda demonstrates that the exemplified *symmetrical* anthracene derivatives exhibit high efficiency light emission and high heat resistance (See e.g., [0115], Table 1, [0117], Table 2). Accordingly, a skilled artisan would not have been motivated to arrive at the claimed *asymmetric* monoanthracene derivatives of formulae (2)-(4) based on the disclosure of Ikeda, absent impermissible hindsight reconstruction, thereby precluding a *prima facie* case of obviousness. Assuming *arguendo* that sufficient motivation and guidance is considered to have been provided by Ikeda to arrive the claimed asymmetric monoanthracene derivatives of formulae (2)-(4), which is clearly not the case, such a case of obviousness is rebutted by a showing of superior properties and secondary considerations.

Applicants respectfully submit that while the broadly defined anthracene derivatives of Ikeda encompass the claimed asymmetric monoanthracene derivatives, Ikeda fails to provide sufficient motivation and guidance to direct a skilled artisan to particularly select the claimed asymmetric

monoanthracene derivatives from either the *tremendously large genus* of anthracene derivatives, or the *preferred symmetric* anthracene derivatives, described and exemplified in Ikeda.

The mere possibility that the anthracene derivatives described and exemplified in Ikeda could be modified to arrive at the claimed asymmetric monoanthracene derivatives of formulae (2)-(4) is an insufficient ground for arriving at a supportable conclusion of unpatentability. A *prima facie* case of obviousness requires that the prior art provide a skilled artisan with sufficient motivation and guidance to make the proposed molecular modifications needed to arrive at the claimed compounds. See e.g., MPEP § 2144.08(II)(A)(4), *Takeda v. Alphapharm*, 83 USPQ2d 1169, 1174 (Fed. Cir. 2007) and *In re Lulu*, 747 F.2d 703, 705, 223 USPQ 1257, 1258 (Fed. Cir. 1984).

Ikeda fails to disclose or suggest modifying the anthracene derivatives described and exemplified therein to arrive at the claimed asymmetric monoanthracene derivatives of formulae (2)-(4). Ikeda demonstrates that the exemplified *symmetrical* anthracene derivatives exhibit high efficiency light emission and high heat resistance (See e.g., [0115], Table 1, [0117], Table 2). Contrary to page 5, lines 5-9 of the Official Action, Ikeda fails to disclose or suggest that the claimed *asymmetric* monoanthracene derivatives of formulae (2)-(4) exhibit superior properties with respect to remarkably improved luminous efficiency and half life as compared to the inferior properties exhibited by conventional symmetric monoanthracene derivatives, such as the symmetric monoanthracene derivative of compound (3) as described and exemplified in Ikeda. Accordingly, a skilled artisan would not have been motivated to arrive at the claimed *asymmetric* monoanthracene derivatives of formulae (2)-(4) based on the disclosure of Ikeda, absent impermissible hindsight reconstruction, thereby precluding a *prima facie* case of obviousness.

Assuming *arguendo* that sufficient motivation and guidance is considered to have been provided by Ikeda to arrive the claimed asymmetric monoanthracene derivatives of formulae (2)-(4), which is clearly not the case, such a case of obviousness is rebutted by a showing of superior properties and secondary considerations.

As discussed in the present specification, traditional organic electroluminescent (EL) devices comprising conventional anthracene derivatives suffer from inferior properties with respect to luminous efficiency and lifetime (See e.g., page 3, lines 16 and 23). Accordingly, there has been a long-felt need to provide an organic EL device that exhibits superior properties with respect to improved luminous efficiency and lifetime. Based on the limited disclosure of Ikeda, other skilled artisans have failed to discover a solution to this long-felt need.

As shown by the comparative experimental data presented in Table 1 of the present specification, which is reproduced in part hereinbelow, Applicants have discovered that an organic electroluminescent device comprising an asymmetric monoanthracene derivative according to formulae (2)-(4) of the present invention exhibits superior properties with respect to remarkably improved luminous efficiency and half life (See e.g., page 4, lines 19-25, page 5, lines 1-15, page 8, lines 8-11, page 104, Table 1 and last paragraph, page 105, lines 1-5).

In contrast, Ikeda fails to disclose or suggest that an organic electroluminescent device comprising an asymmetrical anthracene derivative exhibits superior properties with respect to remarkably improved luminous efficiency and half life.

Table 1

	Compound in Luminescent Layer	Luminous Efficiency	Half Life	Depositing Temperature
		(cd/A)	(hour)	(°C)
Example 21	AN-213/D1	10.9	4,000	261
Example 22	AN-346/D1	10.7	3,300	254
Example 24	AN-45/D1	11.2	6,200	298
Example 25	AN-72/D1	10.9	4,000	262
Example 26	AN-74/D1	11.0	5800	305
Comparative Example 1	an-1/D1	8.7	900	349
Comparative Example 2	an-2/D1	8.7	800	331
Comparative Example 3	an-3/D1	8.9	500	310

Specifically, the organic EL devices of Examples 21, 22 and 24-26, which comprise an asymmetric monoanthracene derivative according to formulae (2)-(4) of the present invention, exhibit superior properties with respect to remarkably improved luminous efficiency and lifetime, as compared to the inferior properties exhibited by the organic EL devices of Comparative Examples 1-3, which comprise conventional symmetric monoanthracene derivatives, such as the symmetric monoanthracene derivative of compound (3) as described and exemplified in Ikeda (See e.g., page 9, line 35).

This evidence clearly demonstrates that the asymmetric monoanthracene derivatives according to formulae (2)-(4) of the present invention exhibit superior properties with respect to remarkably improved luminous efficiency and lifetime, as compared to the inferior properties exhibited by conventional symmetric monoanthracene derivatives, such those described and exemplified in Ikeda.

The Examiner alleges on page 6, lines 6-11 of the Official Action that insufficient evidence has been provided by the Applicants to rebut the case of obviousness over the cited reference. The Examiner is of the opinion that the claimed subject matter is not commensurate in scope with the experimental results set forth in the present specification because Applicants have not demonstrated that superior properties with respect to remarkably improved luminous efficiency and lifetime are exhibited by every species within the genus of asymmetric monoanthracene derivatives according to formulae (2)-(4) of the present invention.

When considering whether proffered evidence is commensurate in scope with the claimed invention, Office personnel should not require the Applicant to demonstrate superior or unexpected results over the entire range of properties possessed by a chemical compound or composition. See e.g., *In re Chupp*, 2 USPQ2d 1437, 1439 (Fed. Cir. 1987). Evidence of unobviousness of a broad range can be proven by a narrower range when one skilled in the art could ascertain a trend that would allow him/her to reasonably extend the probative value thereof. See e.g., *In re Clemens*, 206 USPQ2d 289 (CCPA 1980).

As demonstrated by the experimental data provided in the present specification, the exemplified asymmetric monoanthracene derivatives according to formulae (2)-(4) of the present invention exhibit superior properties with respect to remarkably improved luminous efficiency and lifetime, as compared to the inferior properties exhibited by conventional symmetric monoanthracene derivatives, such those described and exemplified in Ikeda.

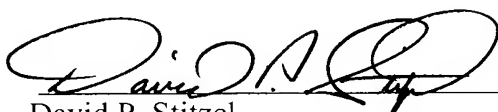
Applicants submit that a skilled artisan could readily ascertain a trend in the exemplified data that would allow him/her to reasonably extend the probative value thereof to other asymmetric monoanthracene derivatives of formulae (2)-(4), in accordance with the present invention, thereby rendering the claims reasonably commensurate in scope with the experimental data provided in the present specification.

Withdrawal of this ground of rejection is respectfully requested.

In conclusion, Applicants submit that the present application is now in condition for allowance and notification to this effect is earnestly solicited.

Respectfully submitted,

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